Fertilizer Schedule for Greenhouse Cucumbers
IN SOUTHWESTERN ONTARIO

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Greenhouse cucumbers must have a proper balance of mineral nutrients continuously to produce a full crop of high-quality fruit. The nutrients must be applied at the right times and in the proper amounts.

The schedule given here is only a guide, and you should adapt it to suit the conditions in your greenhouse each season. To estimate the fertilizer needs of your crop, watch its growth carefully and have soil tests made periodically and tissue tests if possible. No formula can ever take the place of good judgment, but the schedule is useful as a guide for keeping the nutrients properly in balance.

Plants need 15 chemical elements to grow. Twelve of them come from the soil and are absorbed by the plant roots. Plants need five of these, nitrogen, phosphorus, potassium, calcium, and magnesium, in rather large amounts, and seven in very small amounts. A fertile soil supplies all the necessary mineral elements, but continuous cropping soon depletes even the best soil of those that plants use in large amounts. You must replace them if you want the soil to remain productive.

A test crop planted at the rate of 8840 plants per acre on January 15 and harvested until July 15 produced 27 pounds of fruit per plant. It took nutrients from the soil at the following amounts per acre: nitrogen 364 pounds, phosphorus 82, potassium 490, calcium 212, magnesium 51.

This information and the results of fertilizer trials and soil tests were used to develop the fertilizer schedule (Table 1). It is based on a moderate level of soil fertility before planting and no precrop application of fertilizer. Growers often apply 1000 to 2000 pounds of superphosphate per acre or a mixture such as 0-20-20 to the soil before transplanting. This is not really needed if continuous fertilization is practiced during crop growth. It can do little harm if you adjust the schedule accordingly, but much of the phosphate may be fixed by the soil before the plants can use it. Many growers also use manure as a precrop treatment or as a mulch. This may make it difficult to control the nutrition of the growing crop, and there is always a danger of young plants being burned with ammonia from manure that is too fresh.

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Magnesium and Trace Elements

If plant symptoms in the previous crop or the results of soil or tissue tests show that magnesium is lacking, you may apply magnesium sulfate to the soil at the rate of 250 pounds per acre before planting the next crop. Magnesium deficiency may cause a characteristic interveinal yellowing of the lower or middle leaves. If you notice this symptom on the growing crop, apply magnesium sulfate to the soil in water two or three times at 2 pounds per 1000 square feet or to the leaves once as a spray at 5 pounds in 100 gallons of water.

Table 1 Guide to weekly application of fertilizer

	Recommended fertilizer (pounds per 1000 square feet)					Nutrients supplied (pounds per acre)			
Week	10-52-17	Potassium nitrate KNO_3	Diammonium phosphate $(NH_4)_2HPO_4$	Calcium nitrate $Ca(NO_3)_2$	Ammonium nitrate NH_4NO_3	N	P	K	Ca
1	2					9	20	24	
2	1					4	10	12	
3	1					4	10	12	
4	1	1		2	1	37	10	28	21
5	1	1		2	1	37	10	28	21
6	1	1		2	1	37	10	28	21
7	1	1		2	1	37	10	28	21
8	1	1		2	1	37	10	28	21
9	1	1		2	1	37	10	28	21
10	1	1		2	1	37	10	28	21
11		2	1	2	1	48	9	31	21
12		2	1	2	1	63	9	31	21
13		2	1	2	2	63	9	31	21
14		2	1	2	2	63	9	31	21
15		2	1	2	2	63	9	31	21
16		2	1	2	2	63	9	31	21
17		2	1	2	2	63	9	31	21
18		2	1	1	3	71	9	31	21
19		2	1	1	4	86	9	31	10
20		1	1	1	4	81	9	16	10
21		1	1	1	4	81	9	16	10
22		1			4	64		16	
23		1			4	64		16	
24					4	58			
25					4	58			
26					4	58			
Total	11	29	11	32	54	1323	209	587	345

Do not apply trace elements (manganese, boron, copper, zinc, iron, molybdenum) to a greenhouse soil as a regular part of the schedule. If you know or suspect that one or more of them are lacking, have tissue and soil tests made. Get the advice of an agricultural specialist before applying a remedy.

Cultural Practices

The production of greenhouse cucumbers can be substantially improved if you follow certain cultural practices. To improve growth, warm the water for the plants to greenhouse temperature before applying it; cold water chills the roots, retards growth, and eventually reduces the yield of fruit. To permit more light to reach the plants and thus improve growth and fruit production, prune the vegetative growth severely so that a canopy is not allowed to develop. You may sometimes obtain an increase in the number of fruit produced by allowing two main stems to grow on each plant. Blossom thinning always results in an increase in both the number and size of marketable fruit. Remove misshapen or deformed fruit as soon as they appear.

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